

Attorney Docket No. AHUG.011
Serial No. 10/633,471
Response to Office Action dated 2/01/2005

B. SPECIFICATION

Paragraph, page 7, line 12 to page 8, line 2.

United States Patent ~~application 10/146,288 (the '288 application)~~ 6,666,274 (the '274 patent) discloses a section of tubing with coupled end connectors and an insert containing at least one electrical wire. The insert has an outside diameter that is approximately equal to the inside diameter of the improved tubing. The insert also has projections at each end such that when two inserts are placed end to end, the projections will mate up. The insert has at least one groove cut into its side and running the length of the insert. The groove is for the placement of a wire for transmission of power to the well bore or for the placement of a wire for transmission of data from the well bore. The groove is installed down the length of the insert. The groove is deep enough so that when a wire is placed inside the groove, the wire does not project beyond the outside diameter of the insert. The insert may contain as many grooves and wire combinations as are necessary for the particular application. The wire has an electrical connection at each end of the insert. When the inserts are placed end to end, the insert projections line up the electrical connectors and correct mating of the insert projections will result in correct mating of the electrical connectors.

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Paragraph page 8, line 3 to line 10

The inserts of the ~~'288-application~~ the '274 patent are the same length as the tubing and are installed inside the tubing such that the insert is flush with the first end of the tubing. The inserts are then welded to the tubing or secured to the tubing by some other method. A threaded coupler is then installed on the second end of the tubing to protect the exposed insert and electrical connector. The coupler will also be used to secure the improved tubing together. One of the methods disclosed by the ~~'288-application~~ the '274 patent to solve the problem of aligning the electrical connectors for proper mating is the use of outwardly extending projections on one end and corresponding receiving recesses on the opposite end. (See Figs. 10 through 14).

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Paragraph, page 8, lines 18 to page 9, line 2

As discussed above, a need exists for an improvement to the '744 patent to permit alignment of the tubing sections in more than one orientation. In addition, a need exists for an improvement to the '744 patent to allow the introduction of electrical wiring and connections. A further need exists for an improvement to both the '744 patent and the ~~'288~~ application '274 patent so that the benefits of both inventions can be combined in one improved tool joint that allows connection in multiple orientations where the electrical connectors are in the tool joint itself and not in an insert. The needs identified above exist for production tubing, drill pipe, casing, and/or for any cylindrical pipe used to produce hydrocarbons in a subterranean environment.

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Paragraph, page 16, lines 21 to page 17, lines 13

FIG. 12A illustrates an embodiment of tubing joint 100 that further comprises conduit 1010 that may contain conductors. Conductors may be wires, electrically conductive material, or material capable of transmitting optical signals. Examples of conduit 1010 are illustrated in United States Patent application ~~10/146,288-6,666,274~~ (the '274 patent) entitled "Tubing Containing Electrical Wiring Insert," incorporated herein by reference. Conduits 1010 may be formed by inserting a plastic tube with one or more grooves to conductors in a groove between the plastic tube and the tubing. Alternatively, conduits 1010 may be formed by running a conductor through the tubing and coating the conductor with a suitable coating such as plastic, glass-reinforced epoxy (GRE), or thermoplastic matrix materials such as high density polyethylene (HDPE) and polyvinyl chloride (PVC). As shown in FIG. 12A, alignment and continuity of conduits 1010 is ensured by proper orientation and mating of spline 170 with receptacle 180 and by securing tubing joint 100 with coupling collar 700. Connection 1014 represents a contact connection. A person of ordinary skill in the art will recognize that many types of connectors are available for assuring a proper electrical or optical connection between socket assembly 120 and plug assembly 160, and will be able to select the appropriate type. A more preferable way to connect the conductors will be discussed in FIG. 22 through 28.